WHAT IS CLAIMED IS:

1. A magnetic recording head for writing multiple data tracks onto a magnetic media traveling across the head in a media direction, the head comprising a plurality of thin film write elements, each element having a yoke defining a gap at one end of the yoke, each gap substantially aligned along a position line, the yokes alternately positioned on either side of the position line.

2. A magnetic recording head as in claim 1 wherein each yoke is formed on a substrate to have a front region defining the gap and a back region admitting a conductive coil.

3. A magnetic recording head as in claim 2 wherein the write elements are formed on a common substrate.

4. A magnetic recording head as in claim 2 wherein each write element is operative to inductively sense field patterns written onto a data track.

5. A magnetic recording head as in claim 2 wherein each write element contains a read element within the yoke beneath the gap.

6. A magnetic recording head as in claim 5 wherein each yoke comprises an upper section and a lower section separated in a portion of the yoke under the gap by an insulating layer containing the read element.

7. A magnetic recording head as in claim 5 wherein the read element is a flux sensing read element.

8. A magnetic recording head as in claim 1 wherein the position line is normal to the media direction.

9. A magnetic recording head as in claim 1 wherein the position line forms an acute angle with the media direction.

10. A magnetic recording head as in claim 1 wherein each gap has a gap angle with the position line, each write element gap angle opposite in sign from the gap angle of the gap on an adjacent write element.

11. A magnetic recording head as in claim 1 wherein the magnetic media is magnetic tape.

12. A magnetic recording head as in claim 1 further comprising at least one additional plurality of write elements, each additional plurality of write elements having an associated position line, each write element in the at least one additional plurality of write elements having a gap substantially aligned along the associated position line.

13. A magnetic recording head as in claim 12 wherein each write element gap has a gap angle with the associated position line, each gap operative to write a data track on the magnetic media, each write element gap angle opposite in sign from the gap angle of a gap operative to write an adjacent data track.

14. A magnetic recording head for writing multiple tracks onto magnetic media traveling across the recording head, the recording head comprising a plurality of thin film write elements, each write element comprising a yoke having a back region and a front region extending from the back region when viewed in a plane parallel to the magnetic media, the front region forming a gap and the back region admitting a conductive coil, wherein a position line extends across the plane and intersects the projection of each track onto the plane and wherein the write elements are arranged with the yoke front regions substantially aligned across the position line and the yoke back regions lying alternately on either side of the position line.

15. A magnetic recording head as in claim 14 wherein each gap is a thin opening across the yoke front region in the plane, the thin opening defining an associated gap axis through the longest portion of the gap, each gap formed at a

gap angle between the position line and the associated gap axis, wherein the gap angle magnitude is the same for each write element and the gap angle sign is opposite between adjacent write elements.

16. A magnetic recording head as in claim 14 wherein each write element is operative to inductively sense field patterns written onto a track on the magnetic media.

17. A magnetic recording head as in claim 14 wherein each write element further comprises a read element located within the yoke front region beneath the gap.

18. A magnetic recording head as in claim 14 wherein the yoke width tapers gradually from the back region to the front region narrower than the back region.

19. A magnetic recording head as in claim 14 further comprising at least one additional plurality of write elements, each additional plurality of write elements having an associated position line, each write element in the at least one additional plurality of write elements having a gap substantially aligned along the associated position line.

20. A magnetic recording head as in claim 19 wherein each gap is a thin opening across the yoke front region in the plane, the thin opening defining an associated gap axis through the longest portion of the gap, each gap formed at a gap angle between the position line and the associated gap axis, wherein the gap angle magnitude is the same for each write element and the gap angle sign is opposite between write elements operative to write adjacent data tracks.

21. A magnetic recording head as in claim 14 wherein the position line is normal to the direction the magnetic media travels across the recording head.

22. A magnetic recording head as in claim 14 wherein the position line is at an acute angle with the direction magnetic media travels across the recording head.

23. A magnetic recording head for writing multiple data tracks onto magnetic media traveling in a media direction over the head, the head including a plurality of write elements, each write element comprising:

a substrate parallel to the magnetic media as the magnetic media travels by the head;

a first magnetic layer deposited on a portion of the substrate, the first magnetic layer forming a lower section of a yoke;

an insulating layer deposited over a center portion of the yoke lower section;

a second magnetic layer deposited over the insulating layer and the portions of the yoke lower section not covered by the insulating layer, the second magnetic layer forming an upper section of the yoke, the yoke upper section having a back region and a front region extending from the back region, the yoke upper section front region defining a gap; and

a conductive coil comprising a plurality of loops, each loop having a portion passing within the yoke;

whereby current passing through the conductive coil induces magnetic flux in the yoke, the magnetic flux writing one of the multiple tracks on the magnetic media as the magnetic media passes by the gap.

24. A magnetic recording head as in claim 23 wherein each loop of the conductive coil encircles the yoke lower section.

25. A magnetic recording head as in claim 23 wherein each loop of the conductive coil encircles the yoke upper section.

26. A magnetic recording head as in claim 23, each write element having an orientation direction defined by a line from yoke back region to the yoke

front region, wherein each write element has at least one neighboring write element having the opposite orientation direction.

27. A magnetic recording head as in claim 26 wherein the front region of each write element yoke upper section is adjacent to the yoke upper section front region of the at least one neighboring write element.

28. A magnetic recording head as in claim 27, the gap comprising a thin slit across the yoke upper section front region at a gap angle relative to the written data track, wherein the gap angle of each write element is different than the gap angle of the at least one neighboring write element.

29. A magnetic recording head as in claim 23 wherein each write element is operative to inductively sense field patterns written onto a magnetic media data track.

30. A magnetic recording head as in claim 23 wherein the yoke upper section front region is located a greater distance from the substrate than the yoke upper section back region.

31. A magnetic recording head as in claim 30 further comprising a read element located in the insulating layer beneath the gap in the yoke upper section front region.

32. A magnetic recording head as in claim 31 wherein the read element is a magnetoresistive read element.

33. A magnetic recording head as in claim 23 wherein the yoke upper section back region gradually tapers to the width of the narrower yoke upper section front region.

34. A magnetic recording head as in claim 23 wherein the magnetic media is magnetic tape.

35. A method for making a multiple write element magnetic recording head comprising:

forming a substrate having a top surface;

depositing a bottom coil section on the substrate top surface for each write element;

depositing a yoke lower section on the substrate top surface for each write element, each yoke lower section having a back region covering an insulated portion of the write element bottom coil section;

depositing an insulated top coil section on each yoke lower section, the top coil section and the bottom coil section for each write element forming a conductive coil encircling the yoke lower section, each loop of the conductive coil normal to the substrate top surface;

depositing a yoke upper section above each yoke lower section, the yoke upper section and the yoke lower section forming a yoke having a back region and a front region; and

forming a gap in the front region of each yoke upper section.

36. A method as in claim 35, each write element gap lying substantially along one of at least one position line, wherein the yoke back regions are formed to lie alternately on either side of the position line.

37. A method as in claim 36 wherein at least one position line is normal to the direction magnetic media travels across the recording head.

38. A method as in claim 36 wherein at least one position line is at an acute angle with the direction magnetic media travels across the recording head.

39. A method as in claim 36 wherein each gap is operative to write a data track, each gap formed as a thin opening in each yoke upper section front region, the opening formed at a gap angle relative to the position line, the gap angle of each yoke having the same magnitude and opposite sign as the gap angle for the gap of a yoke operative to write an adjacent data track.

40. A method as in claim 35 wherein each gap is formed by focused ion beam etching and backfill.

41. A method as in claim 35 further comprising forming a read element beneath the gap and above the yoke back region of each write element.

42. A method for making a multiple write element magnetic recording head comprising:

forming a substrate having a top surface; and

forming a yoke on the substrate top surface for each write element in a plurality of write elements, each yoke having a back region admitting a conductive coil and a front region defining a gap, each yoke positioned so that each gap is substantially aligned along a position line and so that yoke back regions lie alternately on either side of the position line.

43. A method as in claim 42 wherein forming each yoke comprises:

depositing a yoke lower section;

forming an insulating layer over part of the yoke lower section, the insulating layer enclosing a portion of each loop of the conductive coil;

depositing a yoke upper section, the yoke upper section and the yoke lower section forming the yoke; and

etching the gap in the yoke upper section, the gap parallel with the substrate top surface;

wherein current in the conductive coil induces flux in the yoke flowing in a path normal to the substrate top surface.

44. A method as in claim 43 wherein each gap is operative to write a data track, each gap formed at a gap angle relative to the position line, the gap angle of each yoke having the same magnitude and opposite sign as a gap angle for a yoke gap operative to write an adjacent data track.

45. A method as in claim 43 wherein each gap is formed by focused ion beam etching and backfill.

46. A method as in claim 43 further comprising forming a read element in the insulating layer beneath the gap.

47. A method as in claim 43 wherein the position line is normal to the direction magnetic media travels across the recording head.

48. A method as in claim 43 wherein the position line is at an acute angle with the direction magnetic media travels across the recording head.

49. A method as in claim 43 wherein the plurality of write elements is a first plurality of write elements, the method further comprising forming at least one additional plurality of write elements, each additional plurality of write elements having an associated position line, a yoke for each write element in the at least one additional plurality of write elements having a gap substantially aligned with the associated position line.

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